

Application No.: 10/518,436
Amdt dated: December 19, 2007

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Proposed Amendments to the Claims:

Listing of Claims:

1. (Currently amended) A clip applier for applying a surgical clip in a patient, comprising:

a disposable cartridge including an elongate tube having a proximal end and a distal end, a pair of opposing jaw members extending outwardly from the distal end of the elongate tube, the jaws adapted to transition between an open position and a closed position, and a one-way ratchet mechanism, the ratchet mechanism including mating teeth fixed in relation to the elongate tube, a non-engaging surface opposite the mating teeth, and a ratchet pawl; and

a reusable actuating mechanism coupled to the proximal end of the elongate tube to move the jaw members between the open position and the closed position,

wherein the ratchet mechanism is adapted to begin at a starting point and provide a full actuating stroke of the clip applier, with the ratchet pawl engaging the mating teeth, before the engagement between the ratchet pawl and the mating teeth releases and the ratchet mechanism begins a return stroke with the ratchet pawl returning to the starting point without engaging the mating teeth.

2. (Canceled)

Application No.: 10/518,436
Amdt dated: December 19, 2007

3. (Original) The clip applier of Claim 1, wherein the ratchet mechanism is formed from injection molded plastic.

4. (Original) The clip applier of Claim 1, wherein said actuating mechanism comprises:

a main body connected to the proximal end of the elongate tube; and
an actuating handle coupled to the main body such that movement of the handle in relation to the main body forces the jaw members to move relative to each other between the open position and the closed position.

5. (Original) The clip applier of Claim 1, wherein said cartridge further comprises a push member for advancing the clip into the jaw members.

6. (Original) The clip applier of Claim 5, wherein said cartridge further comprises a biasing spring for maintaining said push member against the clip.

7. (Previously presented) The clip applier of Claim 6, wherein said cartridge further comprises a drive coupling operatively connected to the sliding ratchet pawl for engaging the fixed mating teeth of the ratchet mechanism, the fixed mating teeth being formed on an inner surface of the elongate tube.

Application No.: 10/518,436
Amdt dated: December 19, 2007

8. (Original) The clip applier of Claim 7, wherein the ratchet pawl includes a cantilever arm that engages with the mating teeth.

9. (Original) The clip applier of Claim 7, wherein the drive coupling provides a central connection of the ratchet pawl allowing a degree of pivoting and improved seating of the mating teeth.

10-14. (Canceled)

15. (Currently amended) A clip applier for applying a surgical clip in a patient, comprising:

a disposable cartridge including a housing member having a proximal portion and a distal portion, a pair of opposing jaw members extending outwardly from the distal portion of the housing member, the jaws adapted to transition between an open position and a closed position, and a one-way ratchet mechanism, the ratchet mechanism including mating teeth fixed in relation to the housing member, a non-engaging surface opposite the mating teeth, and a drive bushing adapted to engage the mating teeth; and

a reusable actuating mechanism coupled to the cartridge to move the jaw members between the open position and the closed position,

Application No.: 10/518,436
Amdt dated: December 19, 2007

wherein the ratchet mechanism is adapted to begin at a starting point and provide a full actuating stroke of the clip applier, with the drive bushing engaging the mating teeth, before the engagement between the drive bushing and the mating teeth releases and the ratchet mechanism begins a return stroke with the drive bushing returning to the starting point without engaging the mating teeth.

16. (Canceled)

17. (Original) The clip applier of Claim 15, wherein the ratchet mechanism is formed from injection molded plastic.

18. (Previously presented) The clip applier of Claim 15, wherein said actuating mechanism comprises:

a plurality of tips connected to said jaw members; and

an actuating handle coupled to the tips such that movement of the handle in relation to the tips forces the jaw members to move relative to each other between the open position and the closed position.

19. (Original) The clip applier of Claim 15, wherein said cartridge further comprises a jaw loader for advancing the clip into the jaw members.

Application No.: 10/518,436
Amdt dated: December 19, 2007

20. (Original) The clip applier of Claim 19, wherein said cartridge further comprises a biasing spring for maintaining said jaw loader against the clip.

21. (Previously presented) The clip applier of Claim 20, wherein the drive bushing is operatively connected to the housing member and to the jaw loader for engaging the fixed mating teeth of the ratchet mechanism, the fixed mating teeth being formed on an inner surface of the housing member.

22. (Original) The clip applier of Claim 21, wherein the drive bushing includes a cantilever arm that engages with the mating teeth.

23. (Original) The clip applier of Claim 21, wherein the drive bushing provides a central connection of the jaw loader allowing a degree of pivoting and improved seating of the mating teeth.

24-27. (Canceled)

28. (Previously presented) The clip applier of Claim 7, wherein the ratchet mechanism is a first ratchet mechanism and the disposable cartridge further comprising a second ratchet mechanism.

Application No.: 10/518,436
Amdt dated: December 19, 2007

29. (Previously presented) The clip applier of Claim 28, the second ratchet mechanism being substantially a mirror image of the first ratchet mechanism.

30. (Previously presented) The clip applier of Claim 29, the first and second ratchet mechanisms being adapted to equalize the bearing forces on each side of the drive coupling.

31. (Previously presented) The clip applier of Claim 21, wherein the ratchet mechanism is a first ratchet mechanism and the disposable cartridge further comprising a second ratchet mechanism.

32. (Previously presented) The clip applier of Claim 31, the second ratchet mechanism being substantially a mirror image of the first ratchet mechanism.

33. (Previously presented) The clip applier of Claim 32, the first and second ratchet mechanisms being adapted to equalize the bearing forces on each side of the drive bushing.

Application No.: 10/518,436
Amdt dated: December 19, 2007

34. (Previously presented) The clip applier of Claim 1, the elongate tube having a smooth surface positioned opposite the mating teeth such that the ratchet pawl travels along the smooth surface during the return stroke.

35. (Previously presented) The clip applier of Claim 15, the housing member having a smooth surface positioned opposite the mating teeth such that the drive bushing travels along the smooth surface during the return stroke.

36. (Currently amended) A clip applier for applying a surgical clip in a patient, comprising:

a disposable cartridge including an elongate tube having a proximal end and a distal end, a pair of opposing jaw members extending outwardly from the distal end of the elongate tube, and a one-way ratchet mechanism, the ratchet mechanism including mating teeth, a non-engaging surface opposite the mating teeth, and a ratchet pawl; and

a reusable actuating mechanism coupled to the proximal end of the elongate tube to move the jaw members between an open position and a closed position,

wherein the ratchet pawl is adapted to begin at a starting point where the ratchet pawl is not engaged with the mating teeth, engage the mating teeth at the beginning of an actuating stroke, remain engaged with the mating teeth until the completion of the actuating stroke, release engagement from the mating teeth at

Application No.: 10/518,436
Amdt dated: December 19, 2007

the completion of the actuation stroke, and return to the starting point in a return stroke without engaging the mating teeth.

37. (Previously presented) The clip applier of Claim 36, wherein the actuating mechanism comprises:

a main body connected to the proximal end of the elongate tube; and

an actuating handle coupled to the main body such that movement of the handle in relation to the main body forces the jaw members to move relative to each other between the open position and the closed position.

38. (Previously presented) The clip applier of Claim 36, wherein the cartridge further comprises a push member for advancing the clip into the jaw members.

39. (Previously presented) The clip applier of Claim 38, wherein the cartridge further comprises a biasing spring for maintaining the push member against the clip.

40. (Previously presented) The clip applier of Claim 39, wherein the cartridge further comprises a drive coupling operatively connected to the ratchet pawl for engaging the ratchet pawl with the mating teeth, the mating teeth being formed on an inner surface of the elongate tube.

Application No.: 10/518,436
Amdt dated: December 19, 2007

41. (Previously presented) The clip applier of Claim 40, wherein the ratchet pawl includes a cantilever arm having a sliding member that engages with the mating teeth.

42. (Previously presented) The clip applier of Claim 40, wherein the drive coupling provides a central connection of the ratchet pawl allowing a degree of pivoting and improved seating of the mating teeth.

43. (Previously presented) The clip applier of Claim 40, wherein the ratchet mechanism is a first ratchet mechanism and the disposable cartridge further comprising a second ratchet mechanism.

44. (Previously presented) The clip applier of Claim 43, the second ratchet mechanism being substantially a mirror image of the first ratchet mechanism.

45. (Previously presented) The clip applier of Claim 44, the first and second ratchet mechanisms being adapted to equalize the bearing forces on each side of the drive coupling.

Application No.: 10/518,436
Amdt dated: December 19, 2007

46. (Previously presented) The clip applier of Claim 36, the elongate tube having a smooth surface positioned opposite the mating teeth such that the ratchet pawl travels along the smooth surface during the return stroke.

47. (Currently amended) A clip applier for applying a surgical clip in a patient, comprising:

a disposable cartridge including a housing member having a proximal portion and a distal portion, a pair of opposing jaw members extending outwardly from the distal portion of the housing member, and a one-way ratchet mechanism, the ratchet mechanism including mating teeth, a non-engaging surface opposite the mating teeth, and a drive bushing adapted to engage the mating teeth; and

a reusable actuating mechanism coupled to the cartridge to move the jaw members between an open position and a closed position,

wherein the drive bushing is adapted to begin at a starting point where the drive bushing is not engaged with the mating teeth, engage the mating teeth at the beginning of an actuating stroke, remain engaged with the mating teeth until the completion of the actuating stroke, release engagement from the mating teeth at the completion of the actuating stroke, and return to the starting point in a return stroke without engaging the mating teeth.

Application No.: 10/518,436
Amdt dated: December 19, 2007

48. (Previously presented) The clip applier of Claim 47, wherein the actuating mechanism comprises:

a plurality of tips connected to the jaw members; and

an actuating handle coupled to the tips such that movement of the handle in relation to the tips forces the jaw members to move relative to each other between the open position and the closed position.

49. (Previously presented) The clip applier of Claim 47, wherein the cartridge further comprises a jaw loader for advancing the clip into the jaw members.

50. (Previously presented) The clip applier of Claim 49, wherein the cartridge further comprises a biasing spring for maintaining the jaw loader against the clip.

51. (Previously presented) The clip applier of Claim 50, wherein the drive bushing is operatively connected to the housing member and to the jaw loader for engaging the mating teeth, the mating teeth being formed on an inner surface of the housing member.

Application No.: 10/518,436
Amdt dated: December 19, 2007

52. (Previously presented) The clip applier of Claim 51, wherein the drive bushing includes a cantilever arm having a sliding member that engages with the mating teeth.

53. (Previously presented) The clip applier of Claim 51, wherein the drive bushing provides a central connection of the jaw loader allowing a degree of pivoting and improved seating of the mating teeth.

54. (Previously presented) The clip applier of Claim 51, wherein the ratchet mechanism is a first ratchet mechanism and the disposable cartridge further comprising a second ratchet mechanism.

55. (Previously presented) The clip applier of Claim 54, the second ratchet mechanism being substantially a mirror image of the first ratchet mechanism.

56. (Previously presented) The clip applier of Claim 55, the first and second ratchet mechanisms being adapted to equalize the bearing forces on each side of the drive bushing.

Application No.: 10/518,436
Amdt dated: December 19, 2007

57. (Previously presented) The clip applier of Claim 47, the housing member having a smooth surface positioned opposite the mating teeth such that the drive bushing travels along the smooth surface during the return stroke.